ADDENDUM TO THE QUALITY ASSURANCE SAMPLING PLAN
DIOXIN and FURANS IN AIR SAMPLING
FOR THE
DEEPWATER HORIZON INCIDENT

20 June 2010

PROJECT OBJECTIVES

The objective of this sampling plan addendum is to evaluate possible dioxins in air related to burning of crude oil in the Gulf of Mexico. This document summarizes the methods that will be used for sampling and analysis of collected air samples and should be used in conjunction with the BP Spill Quality Assurance Sampling Plan dated 31 May, 2010. The frequency of these activities and their likely locations are provided.

SAMPLING APPROACH AND PROCEDURES

A total of four (4) samples are expected to be collected from locations decided by the EPA in areas potentially affected by off-shore burning of crude oil. The samples will be collected following details specified below in this document. Samples will be collected using a high volume air sampling approach and the polyurethane foam (PUF) attachment. Samples will be analyzed using method TO-9A by a National Environmental Laboratory Accreditation Program (NELAP) certified laboratory..

Sampling and Sample Handling Procedures

Samples will be collected using equipment and procedures appropriate to the matrix, parameters, and sampling objective. The volume of the sample collected must be sufficient to perform the laboratory analysis requested. Samples must be stored in the proper types of containers and preserved in a manner appropriate to the analysis to be performed.

All clean, decontaminated sampling equipment and sample containers will be maintained in a clean, segregated area. All samples will be collected with clean decontaminated equipment (Appendix A, SOP 1201.01). All samples collected for laboratory analysis will be placed directly into pre-cleaned, unused glass or plastic containers. Sampling personnel will change gloves between each sample collection/handling. All samples will be assembled and catalogued prior to shipping (Appendix A, SOPs 1101.01 and 1102.01) to the designated laboratory.

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Field Quality Control Samples

Field QA/QC samples will be collected so that 10% of samples per matrix will be collected as blind duplicate sample analysis.

Samples will be collected according to the following:

- Blind field duplicate samples will be collected during sample activities for locations selected by the START-3 PTL. The data obtained from these samples will be used to assist the quality assurance of the sampling procedures and laboratory analytical data by following an evaluation of reproducibility of results. Efforts will be made to collect duplicate samples in locations where there is visual evidence of contamination or where contamination is suspected. Blind field duplicate samples will be collected at the rate of one duplicate for every 10 samples collected.

Quality Assurance/Quality Control Samples

EPA contractors shall collect blind field duplicate samples of the air samples, as needed during the sampling effort. Quality assurance/quality control (QA/QC) samples shall be collected according to the following:

- Blind field duplicate samples will be collected during sampling activities at locations selected by the EPA. The data obtained from these samples will be used to assist in the quality assurance of the sampling procedures and laboratory analytical data by allowing an evaluation of reproducibility of results. Blind field duplicate samples will be collected at the rate of one duplicate sample for every 10 samples collected or as directed by the EPA.

The EPA and EPA contractors will be responsible for QA/QC of the field investigation activities. Laboratories utilized during the field activities will be responsible for QA/QC related to the analytical procedures including the analysis of MS/MSD spike duplicates.

- Matrix spike/matrix spike duplicate (MS/MSD) samples shall be specified as part of laboratory requirements. Data obtained from these samples shall be used to assist in the quality assurance of the sampling procedures and laboratory analytical data by allowing an evaluation of reproducibility of results. Efforts shall be made to collect MS/MSD samples in locations where there is visual evidence of contamination or where contamination is suspected. The collection of MS/MSD samples shall be approved by the EPA.

All data will be validated and approved by EPA.

SAMPLE MANAGEMENT

Sample handling, nomenclature and container/equipment decontamination procedures are discussed in the following subsections.

Sample Handling Procedures

Air samples will be collected using equipment and procedures as described below specific for dioxin and furan sampling.. The volume of the sample collected will be sufficient to perform the analysis specified. Samples will be stored in the proper types of containers and preserved in a manner for the analysis to be performed per laboratory guidelines. Personnel responsible for sampling will change gloves between each sample collection/handling activity. The gloves serve two purposes, (1) personnel protection, and (2) prevention of sample cross-contamination. The gloves shall be replaced at a minimum between each sample collected or as frequently as needed.

Sample Nomenclature

Sample identification involves the assignment of sample location numbers to all samples collected during the sampling activity. In preparation for sample plan execution, the EPA will specify the sample location number. Sampling personnel shall record this information using a permanent marker on a label applied to the side of the container.

For the purposes of the activity, each sample will receive an individual identification number consisting of a four-digit number (ex. SW01). A QC Code for the type of sample is added to designate a sample as normal (11), duplicate (12), or rinsate (43).

An example, Sample ID is: SW01-11. This number corresponds to a normal solid waste sample collected from location SW01.

Blind field duplicate samples will be identified in the same manner as the sample locations and will also follow in sequential order. These samples will be given a unique sample number so as not to be obvious to the laboratory.

Sample Container and Equipment Decontamination

Each sample shall be collected with clean decontaminated equipment. EPA and EPA contractors intend to utilize one-time use/dedicated equipment in order to avoid equipment decontamination during sample collection activities. Due to the air sampling methodology detailed below, it is expected one-time use equipment will be utilized and equipment decontamination will not be necessary.

Dioxins and Furans by TO-9A (ERT SOP 2121)

Equipment

- TE-1000 High Volume Air Samplers
- High Volume PUF Tube, glass sorbent cartridge containing 75 mm of PUF, precleaned and certified by a laboratory (SKC 226-131)
- Filter, 102-mm circular binder free quartz micofiber, 0.4 mm thick (SKC 225-1821)
- Sample cartridge aluminum shipping container
- Aluminum foil
- Cooler to store samples at < 4ºC

Sample Collection

Method Parameters -

- Flow Rate – 225-280 L/min
- Sampling Time – 24 hours
- Total Sample Volume – approximately 325-400m^3 (in 24 hr period)

See below for specific Calibration and Sampling Instructions.

Steps for Calibration –

1. Calibration is done with the glass, not the particulate filter and the foam.

2. Make sure calibration orifice (TE-5040A) is within yearly calibration date, and includes calibration slope/intercept sheet: If the sheet is missing, call the manufacturer with the serial number of the orifice and they should be able to provide another copy. After this is done, mount the calibration orifice on top of the aluminum head.

3. Turn on sampler, and connect one end of the manometer to the pressure tap on the orifice, open ball valve completely (handle should be straight up), listen for high pitched squeals for escaping air (leaks), let the PUF warm up for 5 min.

4. Adjust voltage control screw to obtain a reading of 70 in. on the mag. gauge.

5. Do not touch the voltage screw again, until the completion of calibration

6. At 70 in. take a reading from the manometer.

7. Adjust the ball valve so that a reading of 60 in. is obtained on the mag. gauge. Take a manometer reading and repeat steps for 50, 40, and 30.***On the manometer one side goes up, the other goes down: add both of these together for a manometer reading***

8. You should obtain 5 sets of data, 10 numbers in all. Then turn of the sampler.

9. Record the temperature, wind direction, barometric pressure, orifice serial number, orifice slope and intercept with date last certified, today's date, location (***get GPS of location, make a map with lay of the land and any obstacles/tall things IMPORTANT***), operators name, elevation. Check NOAH website for info if not known from weather station

10.Download the excel spread sheet for the PUF TE-1000 off the www.tisch-env.com web site. Input the items listed in blue. You will obtain a new Q-standard and a corrected flow.(***PUF converts data to STANDARD CONDITIONS***). The excel spread sheet will also obtain your new slope, y-intercept, and correlation coefficient. The correlation coefficient is the number of concern, if the # is .990 or higher, the calibration is okay. If it is below .990, recalibrate: checks seals and connections.

Steps for Sampling –

1. Remove face plate from aluminum head, it is not needed during sampling.
2. Place glass filter on top of the screen, with one clean Teflon gasket above and below the filter and tighten the ring. Record sample number
3. Unscrew the 4" holder revealing the sample glass. Replace the glass with new glass and foam. Record foam number
4. Start run. Record time and the setting for the magnehelic gauge. To determine the setting on the magnehelic gauge you must coordinate with the lab to determine volume of sample needed for the 24hr sampling period. After this is completed, follow the steps outlined below in order to determine what valve the magnehelic gauge should be set at in order to have proper sample volume.
5. Check the magnahelic gauge every couple of hours and adjust the screw in order to keep the gauge set at the same value
6. When 24 hours has elapsed, remove the filter, glass, and plug and send to the laboratory. Make sure the glass is wrapped in foil and at least double bagged. Include temperature blank and ship with ice. The filter and glass/plug can be put in the same bag.

Sample Handling Procedures

The PUF tubes are wrapped in aluminum foil to protect them from light and placed in a tightly sealed container for storage. PUF sorbent cartridges are considered clean for up to 30 days when stored in their sealed containers. After sampling, the tube should be wrapped with the original foil and placed into the original container for shipment to the laboratory. Ship and store samples chilled (<4 C) until receipt at the laboratory. Extraction must be performed within 7 days of sampling and analysis within 40 days of extraction.

Important Notes

1. Know the lay of the land and specific areas where sampling will take place. Review guidelines for placement of PUFs (Should be in QASP). PUFs may be operated on ground level or on roof tops (preferably on one story rooftop buildings), PUF should be placed in an unobstructed area (at least two meters from any obstacle to air flow), and exhaust should be set down wind and be moved as wind direction changes throughout the sampling period. Most sampling periods need to be 24 hours, but check with lab.

2. Always bring at least one extra PUF for every sampling mission. Bring High Volume tool kit with extra parts and tools, keep inventory and replaced used items.

3. Get proper # of generators (gas), electrical cords, and mounting materials for all PUFs (not included in tool kit)

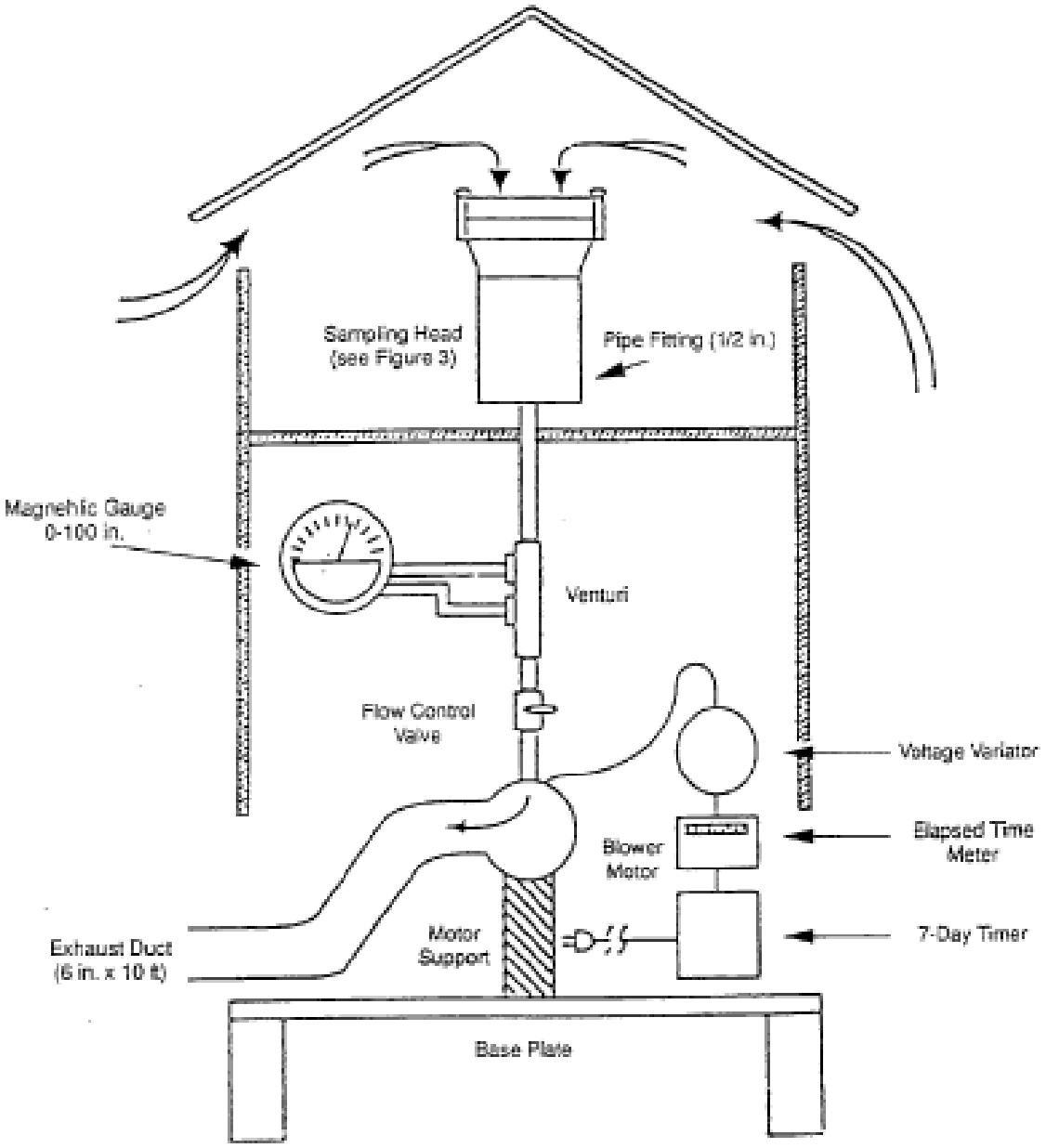
-ELECT. HOOKUP: Blower motor male plugs into voltage control female plug. The voltage control male plug hooks into female 7-day timer. Male 7-day timer plugs into power. You may alter the plug settings depending on the job.

CALIBIBRATION: Performed upon installation, after motor maintenance, once per quarter, or after 360 sampling hours.

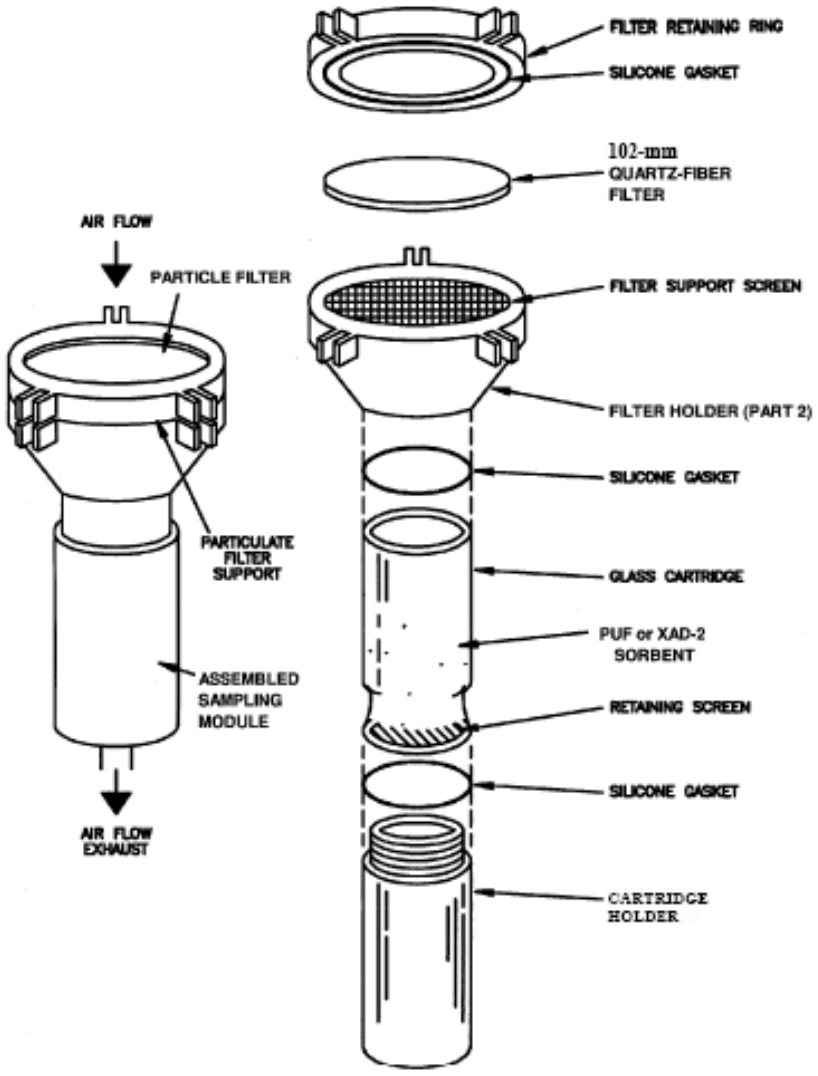
REFERENCE

Determining Volume of Sample

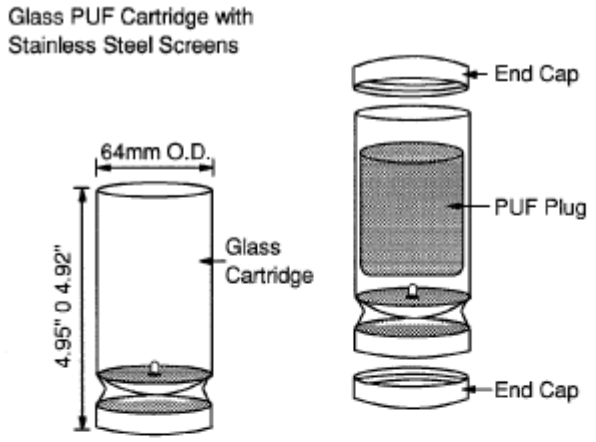
1. Before sending plug and filter to the laboratory. You must calculate the volume of air for each PUF sample. Look at the sample equation below.
2. m^3/min=1/30.278([sqrt(57)(727/760)(298/295)]-(-.2293))
3. =.033 ([Sqrt(55.094)]+.2293)
4. m^3/min=.253 same as 253 liters/minute say the same was 23.3 hours long
5. 253 lpm x 60 min./hr x 23.3 hrs = 353,694 liters of air



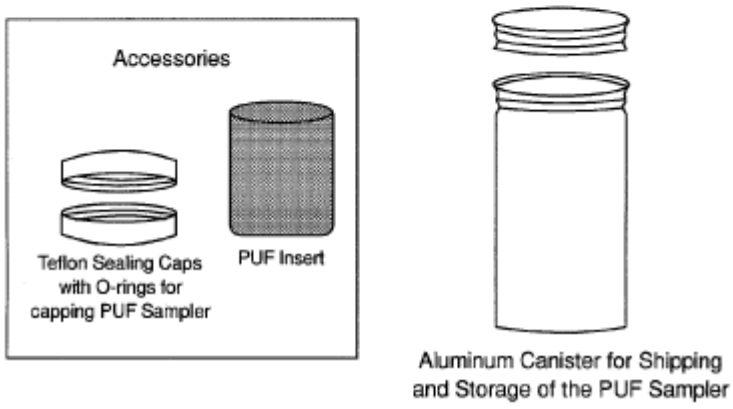
Typical high volume air sampler for Dioxins/Furans



Typical absorbent cartridge assembly for sampling Dioxin/Furans



5a. Glass PUF cartridge, plug, and end caps.



PUF shipping container